TRANSMITTAL OF APPEAL BRIEF (Large Entity)	Docket No. 198-0046

In Re Application Of: **William Francis Weber et al.**

Serial No.	Filing Date	Examiner	Group Art Unit
09/385,739	August 30, 1999	Fred O. Ferriss, III	2123

Invention: **METHOD OF PARAMETRIC DESIGN OF AN INSTRUMENT PANEL SUPPORT STRUCTURE**

TO THE COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on

The fee for filing this Appeal Brief is: **$330.00**

☐ A check in the amount of the fee is enclosed.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

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Signature

Dated: October 7, 2003

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I certify that this document and fee is being deposited on Oct. 7, 2003 with the U.S. Postal Service as first class mail under 37 C.F.R. 1.8 and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Art Unit: 2123

Examiner: Fred O. Ferriss, III

Applicant(s): William Francis Weber et al.

Serial No.: 09/385,739

Filing Date: August 30, 1999

For: METHOD OF PARAMETRIC DESIGN OF AN INSTRUMENT PANEL SUPPORT STRUCTURE

APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

By Notice of Appeal filed August 7, 2003, Applicants have appealed the Final Rejection dated May 12, 2003 and submit this brief in support of that appeal.

REAL PARTY IN INTEREST

The real party in interest is the Assignee, Ford Global Technologies, Inc.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences regarding the present application.

STATUS OF CLAIMS

Claims 1 through 18 have been rejected.

Claims 1 through 18 are being appealed.

STATUS OF AMENDMENTS

An Amendment Under 37 C.F.R. 1.116 was filed on August 7, 2003 in response to the Final Office Action dated May 12, 2003. To date, an Advisory Action has not been received and there is no indication that the Amendment under 37 C.F.R. 1.116 was entered. A Notice of Appeal, along with the requisite fee, was filed on August 7, 2003. The Appeal Brief, along with the requisite fee, is submitted herewith.

SUMMARY OF THE INVENTION

The present invention is a method 18 of parametric design of an instrument panel support structure 100. In block 162, a first input parameter to block 168 represents a three-dimensional coordinate in space of an attachment location for an upper attachment bracket 114 to a cowl portion of a vehicle body 180. In block 164, a second input parameter to block 168 represents a three-dimensional coordinate in space defining an axis for a beam 102. In this example, four coordinate positions are used to reference the beam 102. For example, a first coordinate references the location of the steering wheel along the axis of the beam 102, as shown at 182. A second coordinate references the location of a centerline through the axis of the beam 102, shown at 184. A third coordinate references the location of the passenger side portion 106 of the axis of the beam 102, as shown at 186. A fourth coordinate represents a horizontal length for each of the portions 104, 106, and 108 of the beam 102, as shown at 188A, 188B and 188C,

respectively. In block 166, a third input parameter to block 168 is from the design tool 16. One example is a parameter derived from a knee bolster study. In block 168, the design of the instrument panel support structure 100 is parametrically derived using the inputs from blocks 162, 164, and 166. For example, the shape of the beam 102 is determined in block 170 using the location of the steering wheel 182, the centerline of the beam 184 and the location of the passenger side of the beam 186, and the horizontal locations 188A, 188B and 188C of block 164.

The shape of the beam 102 from block 170, and the attachment location to the cowl 180 from block 162 influences the shape of the upper attachment bracket 114 in block 175. The shape of the beam 102 from block 170 influences the shape of the left and right end brackets 110A 110B. The input from the knee bolster study 166 influences the shape of the driver side knee bolster 128 and passenger side knee bolster 130 in blocks 172 and 174, respectively. The shape of the beam 102 from block 170, the horizontal driver side length 188A from block 164 and the driver side knee bolster 128 location from block 172 determine the shape of the upper driver side knee bolster attachment bracket 132 and outer and inner driver side knee bolster attachment brackets 136, 138 in block 176.

The shape of the center support bracket 150 is influenced by the beam 102 from block 170 and the horizontal center length 188B from block 164, in block 178. The shape of the beam 102 from block 170, the horizontal passenger side length 188C from block 164 and the passenger side knee bolster location from block 174, influence the shape of the upper passenger side knee bolster attachment bracket 142 and outer and inner passenger side knee bolster attachment brackets 146, 148 in block 179.

In block 192, a design of the instrument panel support structure 100 is generated. In diamond 194, the design of the instrument panel support structure 100 is analyzed to determine

if a predetermined design criteria has been met. If the predetermined design criteria have not been met, the design is regenerated by modifying the inputs in blocks 164 and 166 based upon the information learned in diamond 194. If the predetermined design criteria have been met, the design is complete, as indicated in block 196.

The present invention is a method 18 for parametric design of the instrument panel support structure 100 using a computer-aided parametric design technique. In block 202, the methodology selects a vehicle platform from a database, such as a vehicle platform library 14. In block 204, the methodology orients an occupant within an occupant compartment of the vehicle. In block 206, the methodology positions the steering wheel within the occupant compartment of the vehicle using dimensional guidelines.

In block 208, the methodology defines coordinate points in space that position the instrument panel support structure 100 with respect to the vehicle body. In particular, these points define particular reference locations on the beam 102 for determining the shape and attachment of beam 102 and other components or brackets that are secured to the beam 102. One example of a coordinate point is an x,y,z coordinate of an attachment location for the upper attachment bracket 114 to the cowl, shown at 180. Another example of a coordinate point is an x,y,z coordinate of the center support bracket 150 attachment location, for attaching the center support bracket 150 to the vehicle body shown at 189. Still another example of a coordinate point is the x,y,z, coordinate of the attachment of the left and right end bracket 110A, 110B to the vehicle body, as shown at 190. Yet another example of a coordinate point is the x,y,z, coordinate of a horizontal reference for a driver side portion of the beam 102 as shown at 188A. Yet still another example of a coordinate is the x,y,z coordinate of a horizontal reference for the central portion 108 of the beam 102 shown at 188B. A further example of a coordinate is an x,y,z

coordinate of a horizontal reference for the passenger side portion 106 of the beam 102 shown at 188C.

In block 210, the methodology electronically generates the instrument panel support structure 100 design using the input parameters and packages the instrument support structure 100 in relation to the vehicle systems previously described. The design is generated using the design tool 16 such as a computer aided engineering design technique. In block 212, the methodology utilizes the design tool 16 or analysis tool 20 to determine if the instrument panel support structure 100 design meets a predetermined criteria. For example, the instrument panel support structure 100 may be compared to human factors criteria, such as for reach, ergonomics and knee bolster position. The instrument panel support structure 100 may be analyzed using engineering analytical techniques such as finite element analysis, or noise, vibration and handling (NVH) analysis.

In block 214, the methodology varies an input parameter based on the results of the various analysis performed in block 212. For example, the position of the knee bolster 126 may be modified as a result of a knee bolster study. In block 216, the methodology regenerates the model of the instrument panel support structure 100 to take into account the input parameters modified in block 214. Appropriate relationships between the instrument panel support structure 100, vehicle systems and the vehicle are automatically determined and revised according to the modified input parameters. That is, the method of the present invention will automatically rebuild every other affected dimension so that various design alternatives can be evaluated in a timely manner. The methodology ends.

ISSUE

One issue in this Appeal is statutorily formulated in 35 U.S.C. § 102. Specifically, the issue is whether the claimed invention of claims 1, 7, and 16 is disclosed and anticipated under 35 U.S.C. § 102(e) by Weber et al. (U.S. Patent No. 6,110,216). Another issue in this Appeal is statutorily formulated in 35 U.S.C. § 103. Specifically, the issue is whether the claimed invention of claims 1 through 18 is obvious and unpatentable under 35 U.S.C. § 103 over Cavendish et al. (U.S. Patent No. 5,119,309) in view of Saxton et al. (U.S. Patent No. 4,882,692).

GROUPINGS OF CLAIMS

Claim 1 stands or falls alone in regard to the rejection under 35 U.S.C. § 102(e).

Claim 7 stands or falls alone in regard to the rejection under 35 U.S.C. § 102(e).

Claim 16 stands or falls alone in regard to the rejection under 35 U.S.C. § 102(e).

Claims 1 through 6 stand or fall together in regard to the rejection under 35 U.S.C. § 103.

Claims 7 through 15 stand or fall together in regard to the rejection under 35 U.S.C. § 103.

Claims 16 through 18 stand or fall together in regard to the rejection under 35 U.S.C. § 103.

ARGUMENT

35 U.S.C. § 102

As to patentability, 35 U.S.C. § 102(b) provides that a person shall be entitled to a patent unless:

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

A rejection grounded on anticipation under 35 U.S.C. § 102 is proper only where the subject matter claimed is identically disclosed or described in a reference. In other words, anticipation requires the presence of a single prior art reference which discloses each and every element of the claimed invention arranged as in the claim. In re Arkley, 455 F.2d 586, 172 U.S.P.Q. 524 (C.C.P.A. 1972); Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983); Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co., 730 F.2d 1452, 221 U.S.P.Q. 481 (Fed. Cir. 1984).

As to the reference applied by the Examiner, U.S. Patent No. 6,110,216 to Weber et al. discloses an occupant based design method for an automotive vehicle. The method includes the steps of orienting an occupant representation with respect to a common reference point in a computer and representing at least one vehicle system with reference to the common reference point. The method also includes the steps of determining at least one occupant interaction between the occupant representation and the at least one vehicle system and reporting the at least one occupant interaction.

In contradistinction, claim 1 claims the present invention claimed as a method of parametric design of an instrument panel support structure (100) for an instrument panel in a

vehicle. The method includes the steps of selecting a vehicle body structure for the vehicle from a library stored in a memory of a computer system, orienting an occupant within the vehicle body, and locating an instrument support structure relative to the vehicle body. The method also includes the steps of determining an input parameter, wherein the input parameter is a three dimensional coordinate defining the instrument panel support structure relative to the vehicle. The method includes the steps of electronically generating a parametric design of the instrument panel support structure using the input parameter and determining if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique. The method further includes the steps of modifying the input parameter if the parametric design of the instrument panel support structure does not meet the predetermined criteria.

Weber et al. '216 does not disclose or anticipate the claimed invention of claim 1. Specifically, Weber et al. '216 merely discloses an occupant based design method for an automotive vehicle including the steps of orienting an occupant representation with respect to a common reference point in a computer, representing at least one vehicle system with reference to the common reference point, determining at least one occupant interaction between the occupant representation and the at least one vehicle system, and reporting the at least one occupant interaction. Weber et al. '216 lacks determining an input parameter, wherein the input parameter is a three dimensional coordinate defining an instrument panel support structure relative to a vehicle and electronically generating a parametric design of the instrument panel support structure using the input parameter. In Weber et al. '216, the method locates an occupant and instrument panel cluster in the vehicle and electronically represents them, but the method does not determine an input parameter, wherein the input parameter is a three dimensional coordinate

defining an instrument panel support structure relative to the vehicle. Weber et al. '216 fails to disclose the combination of a method of parametric design of an instrument panel support structure including the steps of determining an input parameter, wherein the input parameter is a three dimensional coordinate defining the instrument panel support structure relative to the vehicle, electronically generating a parametric design of the instrument panel support structure using the input parameter, and determining if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique as claimed by Applicants. As a result, the claimed invention is not disclosed by Weber et al. '216.

Against this background, it is submitted that the present invention is not anticipated in view of the disclosure of Weber et al. '216. The reference fails to disclose each and every element of the claimed combination of a method of parametric design of an instrument panel support structure as claimed by Applicants. Therefore, it is respectfully submitted that claim 1 is not anticipated and is allowable over the rejection under 35 U.S.C. § 102(e).

As to claim 7, claim 7 claims a method of parametric design of an instrument panel support structure (100) for a vehicle including the steps of selecting a vehicle body structure for the vehicle from a library stored in a memory of a computer system. The method also includes the steps of orienting an occupant within the vehicle body and locating a steering column relative to the vehicle body. The method includes the steps of determining an input parameter, wherein the input parameter is a three dimensional coordinate defining the instrument panel support structure relative to the vehicle body. The method also includes the steps of electronically generating a parametric design of the instrument panel support structure using the orientation of the occupant, the location of the steering wheel, and the input parameter. The method further includes the steps of comparing the parametric design of the instrument panel

support structure to a predetermined criteria using a computer-aided analytical technique, varying an input parameter to meet the predetermined criteria, and regenerating the parametric design of the instrument panel support structure.

Weber et al. '216 does not disclose or anticipate the claimed invention of claim 7. Specifically, Weber et al. '216 merely discloses an occupant based design method for an automotive vehicle including the steps of orienting an occupant representation with respect to a common reference point in a computer, representing at least one vehicle system with reference to the common reference point, determining at least one occupant interaction between the occupant representation and the at least one vehicle system, and reporting the at least one occupant interaction. Weber et al. '216 lacks determining an input parameter, wherein the input parameter is a three dimensional coordinate defining an instrument panel support structure relative to a vehicle body and electronically generating a parametric design of the instrument panel support structure using the orientation of an occupant, the location of a steering wheel, and the input parameter. In Weber et al. '216, the method locates an occupant and instrument panel cluster in the vehicle and electronically represents them, but the method does not determine an input parameter, wherein the input parameter is a three dimensional coordinate defining the instrument panel support structure relative to the vehicle. Weber et al. '216 fails to disclose the combination of a method of parametric design of an instrument panel support structure including the steps of determining an input parameter, wherein the input parameter is a three dimensional coordinate defining the instrument panel support structure relative to the vehicle body, electronically generating a parametric design of the instrument panel support structure using the orientation of the occupant, the location of the steering wheel, and the input parameter, comparing the parametric design of the instrument panel support structure to a predetermined criteria using a

computer-aided analytical technique, varying an input parameter to meet the predetermined criteria, and regenerating the parametric design of the instrument panel support structure as claimed by Applicants. As a result, the claimed invention is not disclosed by Weber et al. '216.

Against this background, it is submitted that the present invention is not anticipated in view of the disclosure of Weber et al. '216. The reference fails to disclose each and every element of the claimed combination of a method of parametric design of an instrument panel support structure as claimed by Applicants. Therefore, it is respectfully submitted that claim 7 is not anticipated and is allowable over the rejection under 35 U.S.C. § 102(e).

As to claim 16, claim 16 claims a method of parametric design of an instrument panel support structure (100) for an instrument panel in a vehicle including the steps of selecting a vehicle body style for the vehicle from a vehicle library stored in a memory of a computer system and orienting an occupant within the vehicle body. The method also includes the steps of orienting a steering column within the vehicle body, selecting a parameter for locating an instrument panel support structure within the vehicle body, selecting a parameter for attaching the instrument panel support structure within the vehicle body, and selecting a predetermined condition for the instrument panel support structure within the vehicle body. The method includes the steps of electronically generating a parametric design of an instrument panel support structure using the locating parameter, the attaching parameter and the predetermined condition. The method also includes the steps of packaging an instrument panel component within the parametric design of the instrument panel support structure and determining if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique. The method further includes the steps of determining if the parametric design of the instrument panel support structure should be changed if the

predetermined criteria is not met, determining if a parameter should be changed if the parametric design of the instrument panel support structure should be changed, and modifying the parameter if the parameter should be changed.

Weber et al. '216 does not disclose or anticipate the claimed invention of claim 16. Specifically, Weber et al. '216 merely discloses an occupant based design method for an automotive vehicle including the steps of orienting an occupant representation with respect to a common reference point in a computer, representing at least one vehicle system with reference to the common reference point, determining at least one occupant interaction between the occupant representation and the at least one vehicle system, and reporting the at least one occupant interaction. Weber et al. '216 lacks selecting a parameter for locating an instrument panel support structure within the vehicle body, selecting a parameter for attaching the instrument panel support structure within the vehicle body, selecting a predetermined condition for the instrument panel support structure within the vehicle body, and electronically generating a parametric design of an instrument panel support structure using the locating parameter, the attaching parameter and the predetermined condition. In Weber et al. '216, the method locates an occupant and instrument panel cluster in the vehicle and electronically represents them, but the method does not select a parameter for locating an instrument panel support structure within a vehicle body, select a parameter for attaching the instrument panel support structure within the vehicle body, and select a predetermined condition for the instrument panel support structure within the vehicle body. Weber et al. '216 fails to disclose the combination of a method of parametric design of an instrument panel support structure including the steps of selecting a parameter for locating an instrument panel support structure within the vehicle body, selecting a parameter for attaching the instrument panel support structure within the vehicle body, selecting a predetermined condition

for the instrument panel support structure within the vehicle body, electronically generating a parametric design of an instrument panel support structure using the locating parameter, the attaching parameter and the predetermined condition, determining if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique, determining if a parameter should be changed if the parametric design of the instrument panel support structure should be changed, and modifying the parameter if the parameter should be changed as claimed by Applicants. As a result, the claimed invention is not disclosed by Weber et al. '216.

Against this background, it is submitted that the present invention is not anticipated in view of the disclosure of Weber et al. '216. The reference fails to disclose each and every element of the claimed combination of a method of parametric design of an instrument panel support structure as claimed by Applicants. Therefore, it is respectfully submitted that claim 16 is not anticipated and is allowable over the rejection under 35 U.S.C. § 102(e).

35 U.S.C. § 103

As to patentability, 35 U.S.C. § 103 provides that a patent may not be obtained:

> If the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Id.

The United States Supreme Court interpreted the standard for 35 U.S.C. § 103 in Graham v. John Deere, 383 U.S. 1, 148 U.S.P.Q. 459 (1966). In Graham, the Court stated that under 35 U.S.C. § 103:

> The scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be

> ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined. 148 U.S.P.Q. at 467.

Using the standard set forth in Graham, the scope and content of the prior art relied upon by the Examiner will be determined.

U.S. Patent No. 5,119,309 to Cavendish et al. discloses a feature based method of designing automotive panels. The method includes the steps of entering into a computer a plurality of coordinate data points and connecting the data points with straight lines and rounding the corner of the thereby defined polygon with a circle of radius to define a smooth closed curve. The method also includes the steps of generating output data which defines the composite surface and machining the workpiece in accordance with the output data.

U.S. Patent No. 4,882,692 to Saxton et al. discloses methods and systems for generating parametric designs. A method includes the steps of employing a data entry device to establish a master drawing with text and dimensions represented by variables and continuously displaying the updated master drawing on a monitor as the master drawing is established. The method also includes the steps of displaying on the monitor a design plan with an array of cells and employing the data entry device to input to the design plan each of one or more of the cells a statement which includes a solicitation for information. The method also includes the steps of employing the data entry device to input to the computer an instruction and employing the data entry device to input to the computer information solicited. The method includes the steps of displaying the information inputted by the user on the monitor so that the user can check the responses inputted to the computer and electronically storing in the computer data representing the accomplished design.

In contradistinction, claim 1 claims the invention as a method of parametric design of an instrument panel support structure (100) for an instrument panel in a vehicle. The method includes the steps of selecting a vehicle body structure for the vehicle from a library stored in a memory of a computer system, orienting an occupant within the vehicle body, and locating an instrument panel support structure relative to the vehicle body. The method also includes the steps of determining an input parameter, wherein the input parameter is a three dimensional coordinate defining the instrument panel support structure relative to the vehicle. The method includes the steps of electronically generating a parametric design of the instrument panel support structure using the input parameter and determining if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique. The method further includes the steps of modifying the input parameter if the parametric design of the instrument panel support structure does not meet the predetermined criteria.

The United States Court of Appeals for the Federal Circuit (CAFC) has stated in determining the propriety of a rejection under 35 U.S.C. § 103(a), it is well settled that the obviousness of an invention cannot be established by combining the teachings of the prior art absent some teaching, suggestion or incentive supporting the combination. See In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 227 U.S.P.Q. 657 (Fed. Cir. 1985); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 221 U.S.P.Q. 929 (Fed. Cir. 1984). The law followed by our court of review and the Board of Patent Appeals and Interferences is that " [a] prima facie case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art." In re Rinehart, 531

F.2d 1048, 1051, 189 U.S.P.Q. 143, 147 (C.C.P.A. 1976). See also In re Lalu, 747 F.2d 703, 705, 223 U.S.P.Q. 1257, 1258 (Fed. Cir. 1984) ("In determining whether a case of prima facie obviousness exists, it is necessary to ascertain whether the prior art teachings would appear to be sufficient to one of ordinary skill in the art to suggest making the claimed substitution or other modification.")

As to the differences between the prior art and the claims at issue, the primary reference to Cavendish et al. '309 merely discloses a feature based method of designing automobile panels including the steps of entering into a computer a plurality of coordinate data points, connecting the data points with straight lines and rounding the corner of the thereby defined polygon with a circle of radius to define a smooth closed curve, generating output data which defines the composite surface, and machining the workpiece in accordance with the output data. Cavendish et al. '309 lacks determining an input parameter, wherein the input parameter is a three dimensional coordinate defining an instrument panel support structure relative to a vehicle, electronically generating a parametric design of an instrument panel support structure using the input parameter, and determining if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique. In Cavendish et al. '309, there is no parametric design.

The secondary reference to Saxton et al. '692 merely discloses methods and systems for generating parametric designs including the steps of establishing a master drawing with text and dimensions, continuously displaying the updated master drawing on a monitor, displaying on the monitor a design plan with an array of cells, inputting to the design plan a statement which includes a solicitation for information, inputting to the computer an instruction and information solicited, displaying the information inputted on the monitor so that the user can

check the responses inputted to the computer, and electronically storing in the computer data representing the accomplished design. Saxton et al. '692 lacks selecting a vehicle body structure for a vehicle from a library stored in a memory of a computer system, orienting an occupant within the vehicle body, locating an instrument panel support structure relative to the vehicle body, determining an input parameter, wherein the input parameter is a three dimensional coordinate defining an instrument panel support structure relative to the vehicle body, and electronically generating a parametric design of an instrument panel support structure using the input parameter. In Saxton et al. '692, while a parametric design can be electronically generated, the parametric design is not of an instrument panel support structure using an input parameter of a three dimensional coordinate defining an instrument panel support structure relative to the vehicle.

As to the level of ordinary skill in the pertinent art, Cavendish et al. '309 merely discloses designing automobile panels by entering into a computer a plurality of coordinate data points, connecting the data points with straight lines and rounding the corner of the thereby defined polygon with a circle of radius to define a smooth closed curve and generating output data which defines the composite surface. Saxton et al. '692 merely discloses generating parametric designs by establishing a master drawing with text and dimensions, continuously displaying the updated master drawing on a monitor, displaying on the monitor a design plan with an array of cells, inputting to the design plan a statement which includes a solicitation for information, inputting to the computer an instruction and information solicited, displaying the information inputted on the monitor so that the user can check the responses inputted to the computer, and electronically storing in the computer data representing the accomplished design. However, there is absolutely no teaching of a level of skill in the instrument panel art to include

determining an input parameter that is a three dimensional coordinate defining an instrument panel support structure relative to a vehicle body and electronically generating a parametric design of an instrument panel support structure using the input parameter. In fact, Cavendish et al. '309 does not even teach parametric design. Saxton et al. '692 fails to determine an input parameter that is a three dimensional coordinate defining an instrument panel support structure or determining if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique. Further, there is no motivation in the art to substitute the coordinate data points for the automotive panel of Cavendish et al. '309 for the parametric design of Saxton et al. '692 because Cavendish et al. '309 and Saxton et al. '692 operate in an entirely different manner. The references, if combinable, fail to teach or suggest the combination of a method of parametric design of an instrument panel support structure including the steps of selecting a vehicle body structure for a vehicle from a library stored in a memory of a computer system, orienting an occupant within the vehicle body, locating an instrument panel support structure relative to the vehicle body, determining an input parameter, wherein the input parameter is a three dimensional coordinate defining an instrument panel support structure relative to the vehicle body, electronically generating a parametric design of the instrument panel support structure using the input parameter, and determining if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique as claimed by Applicants. The Examiner has failed to establish a case of prima facie obviousness.

The present invention sets forth a unique and non-obvious combination of a method of parametric design of an instrument panel support structure by determining an input parameter that is a three dimensional coordinate defining an instrument panel support structure

relative to the vehicle, electronically generating a parametric design of the instrument panel support structure using the input parameter, and determining if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique. Advantageously, the method of parametric design of an instrument panel support structure utilizes parametric automated design in light of predetermined criteria.

Obviousness under § 103(a) is a legal conclusion based on factual evidence (In re Fine, 837 F.2d 1071, 1073, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988)), and the subjective opinion of the Examiner as to what is or is not obvious, without evidence in support thereof, does not suffice. The Examiner may not, because he/she doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. See In re Warner, 379 F. 2d 1011, 154 U.S.P.Q. 173 (C.C.P.A. 1967). Because the Examiner has not provided a sufficient factual basis that is supportive of his/her position (see In re Warner, 379 F.2d 1011, 1017, 154 U.S.P.Q. 173, 178 (C.C.P.A. 1967), cert. denied, 389 U.S. 1057 (1968)), the rejection of claim 1 is improper.

Against this background, it is submitted that the present invention of claim 1 is not obvious in view of Cavendish et al. '309 and Saxton et al. '692. The references fail to teach or suggest the combination of a method of parametric design of an instrument panel support structure of claim 1. Therefore, it is respectfully submitted that claim 1 is not obvious and is allowable over the rejection under 35 U.S.C. § 103.

The law is clear that a claim in dependent form shall be construed to incorporate by reference all of the limitations of the claim to which it refers. 35 U.S.C. § 112, ¶ 4. Dependent claims 2 through 6 perfect and further limit independent claim 1. Claim 2 defines that the input parameter is a three dimensional coordinate for an attachment location of the instrument

panel support structure relative to the vehicle. Claim 3 defines that the input parameter is a three dimensional coordinate for positioning a cross car support beam portion of the instrument panel support structure relative to the vehicle. Claim 4 defines that the input parameter is a three dimensional coordinate for positioning a knee bolster portion of the instrument panel support structure relative to the vehicle. Claim 5 defines that the method includes the step of using a computer-aided engineering analytical technique to determine whether the design of the instrument panel support structure meets a predetermined criteria. Claim 6 defines that the method includes the step of using a computer-aided human factors analytical technique to determine whether the design of the instrument panel support structure meets a predetermined criteria. Based on the above, it is respectfully submitted that claims 2 through 6 are not obvious and are allowable over the rejection under 35 U.S.C. § 103.

As to independent claim 7, claim 7 claims the invention as a method of parametric design of an instrument panel support structure (100) for a vehicle including the steps of selecting a vehicle body structure for the vehicle from a library stored in a memory of a computer system. The method also includes the steps of orienting an occupant within the vehicle body and locating a steering column relative to the vehicle body. The method includes the steps of determining an input parameter, wherein the input parameter is a three dimensional coordinate defining the instrument panel support structure relative to the vehicle body. The method also includes the steps of electronically generating a parametric design of the instrument panel support structure using the orientation of the occupant, the location of the steering wheel, and the input parameter. The method further includes the steps of comparing the parametric design of the instrument panel support structure to a predetermined criteria using a computer-aided analytical technique, varying an input parameter to meet the predetermined criteria, and regenerating the parametric design of

the instrument panel support structure.

None of the references cited, either alone or in combination with each other, teach or suggest the claimed invention of claim 7. Specifically, Cavendish et al. '309 merely discloses a feature based method of designing automobile panels including the steps of entering into a computer a plurality of coordinate data points, connecting the data points with straight lines and rounding the corner of the thereby defined polygon with a circle of radius to define a smooth closed curve, generating output data which defines the composite surface, and machining the workpiece in accordance with the output data. Cavendish et al. '309 lacks determining an input parameter, wherein the input parameter is a three dimensional coordinate defining an instrument panel support structure relative to a vehicle, electronically generating a parametric design of an instrument panel support structure using the orientation of an occupant, the location of a steering wheel, and the input parameter, and determining if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique. In Cavendish et al. '309, there is no parametric design. Saxton et al. '692 merely discloses methods and systems for generating parametric designs including the steps of establishing a master drawing with text and dimensions, continuously displaying the updated master drawing on a monitor, displaying on the monitor a design plan with an array of cells, inputting to the design plan a statement which includes a solicitation for information, inputting to the computer an instruction and information solicited, displaying the information inputted on the monitor so that the user can check the responses inputted to the computer, and electronically storing in the computer data representing the accomplished design. Saxton et al. '692 lacks selecting a vehicle body structure for the vehicle from a library stored in a memory of a computer system, orienting an occupant within the vehicle body, locating a steering column relative to the vehicle body,

determining an input parameter that is a three dimensional coordinate defining the instrument panel support structure relative to the vehicle body, and electronically generating a parametric design of the instrument panel support structure using the orientation of the occupant, the location of the steering wheel, and the input parameter. In Saxton et al. '692, while a parametric design can be electronically generated, the parametric design is not of an instrument panel support structure using the orientation of an occupant, the location of a steering wheel, and an input parameter of a three dimensional coordinate defining an instrument panel support structure relative to the vehicle. There is absolutely no teaching of a level of skill in the instrument panel art to determine an input parameter that is a three dimensional coordinate defining the instrument panel support structure relative to the vehicle body, and electronically generate a parametric design of the instrument panel support structure using the orientation of the occupant, the location of the steering wheel, and the input parameter. Contrary to the Examiner's opinion, it is not obvious to substitute the coordinate data points for the automotive panel of Cavendish et al. '309 for the parametric design of Saxton et al. '692 because Cavendish et al. '309 and Saxton et al. '692 operate in an entirely different manner. The Examiner may not, because he doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. See In re Warner, 379 F. 2d 1011, 154 U.S.P.Q. 173 (C.C.P.A. 1967).

Applicants are not attacking the references individually, but are clearly pointing out that each reference is deficient and, if combined (although Applicants maintain that they are not combinable), the combination is deficient. The present invention sets forth a unique and non-obvious combination of a method of parametric design of an instrument panel support structure that utilizes parametric automated design in light of predetermined criteria. The references, if

combinable, fail to teach or suggest the combination of a method of parametric design of an instrument panel support structure including the steps of selecting a vehicle body structure for the vehicle from a library stored in a memory of a computer system, orienting an occupant within the vehicle body, locating a steering column relative to the vehicle body, determining an input parameter, wherein the input parameter is a three dimensional coordinate defining the instrument panel support structure relative to the vehicle body, electronically generating a parametric design of the instrument panel support structure using the orientation of the occupant, the location of the steering wheel, and the input parameter, comparing the parametric design of the instrument panel support structure to a predetermined criteria using a computer-aided analytical technique, varying an input parameter to meet the predetermined criteria, and regenerating the parametric design of the instrument panel support structure as claimed by Applicants.

Further, the CAFC has held that "[t]he mere fact that prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification". In re Gordon, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). The Examiner has failed to show how the prior art suggested the desirability of modification to achieve Applicants' invention. Thus, the Examiner has failed to establish a case of prima facie obviousness.

Against this background, it is submitted that the present invention of claim 7 is not obvious in view of Cavendish et al. '309 and Saxton et al. '692. The references fail to teach or suggest the combination of a method of parametric design of an instrument panel support structure of claim 7. Therefore, it is respectfully submitted that claim 7 is not obvious and is allowable over the rejection under 35 U.S.C. § 103.

Dependent claims 8 through 15 perfect and further limit independent claim 7. Claim 8 defines that the step of selecting an input parameter includes selecting an attachment location for attaching an upper attachment bracket portion of the instrument panel support structure relative to the vehicle. Claim 9 defines that the step of selecting an input parameter includes selecting an attachment location for securing a center support bracket portion of the instrument panel support structure relative to the vehicle. Claim 10 defines that the step of selecting an input parameter includes selecting an attachment location for securing an outer portion of the instrument panel support structure relative to the vehicle. Claim 11 defines that the step of selecting an input parameter includes defining a centerline location for a center portion of the instrument panel support structure relative to the vehicle. Claim 12 defines that the step of selecting an input parameter includes defining a centerline location for a driver side portion of the instrument panel support structure relative to the vehicle. Claim 13 defines that step of selecting an input parameter includes defining a centerline location for a passenger side portion of the instrument panel support structure relative to the vehicle. Claim 14 defines that the method includes the step of using a computer-aided engineering analytical technique to determine whether the design of the instrument panel support structure meets a predetermined criteria. Claim 15 defines that the method includes the step of using a computer-aided human factors analytical technique to determine whether the design of the instrument panel support structure meets a predetermined criteria. Based on this, it is respectfully submitted that claims 8 through 15 are not obvious and are allowable over the rejection under 35 U.S.C. § 103.

As to claim 16, claim 16 claims the invention as a method of parametric design of an instrument panel support structure (100) for an instrument panel in a vehicle including the steps of selecting a vehicle body style for the vehicle from a vehicle library stored in a memory of

a computer system and orienting an occupant within the vehicle body. The method also includes the steps of orienting a steering column within the vehicle body, selecting a parameter for locating an instrument panel support structure within the vehicle body, selecting a parameter for attaching the instrument panel support structure within the vehicle body, and selecting a predetermined condition for the instrument panel support structure within the vehicle body. The method includes the steps of electronically generating a parametric design of an instrument panel support structure using the locating parameter, the attaching parameter and the predetermined condition. The method also includes the steps of packaging an instrument panel component within the parametric design of the instrument panel support structure and determining if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique. The method further includes the steps of determining if the parametric design of the instrument panel support structure should be changed if the predetermined criteria is not met, determining if a parameter should be changed if the parametric design of the instrument panel support structure should be changed, and modifying the parameter if the parameter should be changed.

None of the references cited, either alone or in combination with each other, teach or suggest the claimed invention of claim 16. Specifically, Cavendish et al. '309 merely discloses a feature based method of designing automobile panels including the steps of entering into a computer a plurality of coordinate data points, connecting the data points with straight lines and rounding the corner of the thereby defined polygon with a circle of radius to define a smooth closed curve, generating output data which defines the composite surface, and machining the workpiece in accordance with the output data. Cavendish et al. '309 lacks selecting a parameter for locating an instrument panel support structure within the vehicle body, selecting a parameter

for attaching the instrument panel support structure within the vehicle body, selecting a predetermined condition for the instrument panel support structure within the vehicle body, electronically generating a parametric design of an instrument panel support structure using the locating parameter, the attaching parameter and the predetermined condition, and determining if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique. In Cavendish et al. '309, there is no parametric design.

Saxton et al. '692 merely discloses methods and systems for generating parametric designs including the steps of establishing a master drawing with text and dimensions, continuously displaying the updated master drawing on a monitor, displaying on the monitor a design plan with an array of cells, inputting to the design plan a statement which includes a solicitation for information, inputting to the computer an instruction and information solicited, displaying the information inputted on the monitor so that the user can check the responses inputted to the computer, and electronically storing in the computer data representing the accomplished design. Saxton et al. '692 lacks selecting a parameter for locating an instrument panel support structure within the vehicle body, selecting a parameter for attaching the instrument panel support structure within the vehicle body, selecting a predetermined condition for the instrument panel support structure within the vehicle body, and electronically generating a parametric design of an instrument panel support structure using the locating parameter, the attaching parameter and the predetermined condition. In Saxton et al. '692, while a parametric design can be electronically generated, the parametric design is not of an instrument panel support structure using a locating parameter, an attaching parameter and a predetermined condition.

There is absolutely no teaching of a level of skill in the instrument panel art to select a parameter for locating an instrument panel support structure within a vehicle body, select a parameter for attaching an instrument panel support structure within the vehicle body, select a predetermined condition for the instrument panel support structure within the vehicle body, electronically generate a parametric design of the instrument panel support structure using the locating parameter, the attaching parameter and the predetermined condition, and determine if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique. Further, there is no motivation in the art to substitute the coordinate data points for the automotive panel of Cavendish et al. '309 for the parametric design of Saxton et al. '692 because Cavendish et al. '309 and Saxton et al. '692 operate in an entirely different manner. The Examiner may not, because he doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. See In re Warner, 379 F. 2d 1011, 154 U.S.P.Q. 173 (C.C.P.A. 1967).

The present invention sets forth a unique and non-obvious combination of a method of parametric design of an instrument panel support structure that utilizes parametric automated design in light of predetermined criteria. The references, if combinable, fail to teach or suggest the combination of a method of parametric design of an instrument panel support structure including the steps of selecting a vehicle body style for the vehicle from a vehicle library stored in a memory of a computer system, orienting an occupant within the vehicle body, orienting a steering column within the vehicle body, selecting a parameter for locating an instrument panel support structure within the vehicle body, selecting a parameter for attaching the instrument panel support structure within the vehicle body, selecting a predetermined condition for the instrument panel support structure within the vehicle body, electronically generating a

parametric design of an instrument panel support structure using the locating parameter, the attaching parameter and the predetermined condition, packaging an instrument panel component within the parametric design of the instrument panel support structure, determining if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique, determining if the parametric design of the instrument panel support structure should be changed if the predetermined criteria is not met, determining if a parameter should be changed if the parametric design of the instrument panel support structure should be changed, and modifying the parameter if the parameter should be changed as claimed by Applicants. The Examiner has failed to establish a case of prima facie obviousness.

Against this background, it is submitted that the present invention of claim 16 is not obvious in view of Cavendish et al. '309 and Saxton et al. '692. The references fail to teach or suggest the combination of a method of parametric design of an instrument panel support structure of claim 16. Therefore, it is respectfully submitted that claim 16 is not obvious and is allowable over the rejection under 35 U.S.C. § 103.

Dependent claims 17 and 18 perfect and further limit independent claim 16. Claim 17 defines that the method includes the step of using a computer-aided engineering analytical technique to determine whether the design of the instrument panel support structure meets a predetermined criteria. Claim 18 defines that the step of using a computer-aided human factors analytical technique to determine whether the design of the instrument panel support structure meets a predetermined criteria. Based on this, it is respectfully submitted that claims 17 and 18 are not obvious and are allowable over the rejection under 35 U.S.C. § 103.

In conclusion, it is respectfully submitted that the rejections of claims 1 through 18 are improper and should be reversed.

Respectfully submitted,

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APPENDIX

The claims on appeal are as follows:

1. A method of parametric design of an instrument panel support structure for an instrument panel in a vehicle comprising the steps of:

selecting a vehicle body structure for the vehicle from a library stored in a memory of a computer system;

orienting an occupant within the vehicle body;

locating an instrument support structure relative to the vehicle body;

determining an input parameter, wherein the input parameter is a three dimensional coordinate defining the instrument panel support structure relative to the vehicle;

electronically generating a parametric design of the instrument panel support structure using the input parameter;

determining if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique; and

modifying the input parameter if the parametric design of the instrument panel support structure does not meet the predetermined criteria.

2. A method as set forth in claim 1 wherein the input parameter is a three dimensional coordinate for an attachment location of the instrument panel support structure relative to the vehicle.

3. A method as set forth in claim 1 wherein the input parameter is a three dimensional coordinate for positioning a cross car support beam portion of the instrument panel support structure relative to the vehicle.

4. A method as set forth in claim 1 wherein the input parameter is a three dimensional coordinate for positioning a knee bolster portion of the instrument panel support structure relative to the vehicle.

5. A method as set forth in claim 1 including the step of using a computer-aided engineering analytical technique to determine whether the design of the instrument panel support structure meets a predetermined criteria.

6. A method as set forth in claim 1 including the step of using a computer-aided human factors analytical technique to determine whether the design of the instrument panel support structure meets a predetermined criteria.

7. A method of parametric design of an instrument panel support structure for a vehicle comprising the steps of:

selecting a vehicle body structure for the vehicle from a library stored in a memory of a computer system;

orienting an occupant within the vehicle body;

locating a steering column relative to the vehicle body;

determining an input parameter, wherein the input parameter is a three dimensional coordinate defining the instrument panel support structure relative to the vehicle body;

electronically generating a parametric design of the instrument panel support structure using the orientation of the occupant, the location of the steering wheel, and the input parameter;

comparing the parametric design of the instrument panel support structure to a predetermined criteria using a computer-aided analytical technique;

varying an input parameter to meet the predetermined criteria; and

regenerating the parametric design of the instrument panel support structure.

8. A method as set forth in claim 7 wherein said step of selecting an input parameter includes selecting an attachment location for attaching an upper attachment bracket portion of the instrument panel support structure relative to the vehicle.

9. A method as set forth in claim 7 wherein said step of selecting an input parameter includes selecting an attachment location for securing a center support bracket portion of the instrument panel support structure relative to the vehicle.

10. A method as set forth in claim 7 wherein said step of selecting an input parameter includes selecting an attachment location for securing an outer portion of the instrument panel support structure relative to the vehicle.

11. A method as set forth in claim 7 wherein said step of selecting an input parameter includes defining a centerline location for a center portion of the instrument panel support structure relative to the vehicle.

12. A method as set forth in claim 7 wherein said step of selecting an input parameter includes defining a centerline location for a driver side portion of the instrument panel support structure relative to the vehicle.

13. A method as set forth in claim 7 wherein said step of selecting an input parameter includes defining a centerline location for a passenger side portion of the instrument panel support structure relative to the vehicle.

14. A method as set forth in claim 7 including the step of using a computer-aided engineering analytical technique to determine whether the design of the instrument panel support structure meets a predetermined criteria.

15. A method as set forth in claim 7 including the step of using a computer-aided human factors analytical technique to determine whether the design of the instrument panel support structure meets a predetermined criteria.

16. A method of parametric design of an instrument panel support structure for an instrument panel in a vehicle comprising the steps of:

selecting a vehicle body style for the vehicle from a vehicle library stored in a memory of a computer system;

orienting an occupant within the vehicle body;

orienting a steering column within the vehicle body;

selecting a parameter for locating an instrument panel support structure within the vehicle body;

selecting a parameter for attaching the instrument panel support structure within the vehicle body;

selecting a predetermined condition for the instrument panel support structure within the vehicle body;

electronically generating a parametric design of an instrument panel support structure using the locating parameter, the attaching parameter and the predetermined condition;

packaging an instrument panel component within the parametric design of the instrument panel support structure;

determining if the parametric design of the instrument panel support structure meets a predetermined criteria using a computer-aided analytical technique;

determining if the parametric design of the instrument panel support structure should be changed if the predetermined criteria is not met;

determining if a parameter should be changed if the parametric design of the instrument panel support structure should be changed; and

modifying the parameter if the parameter should be changed.

17. A method as set forth in claim 16 including the step of using a computer-aided engineering analytical technique to determine whether the design of the instrument panel support structure meets a predetermined criteria.

18. A method as set forth in claim 16 including the step of using a computer-aided human factors analytical technique to determine whether the design of the instrument panel support structure meets a predetermined criteria.